

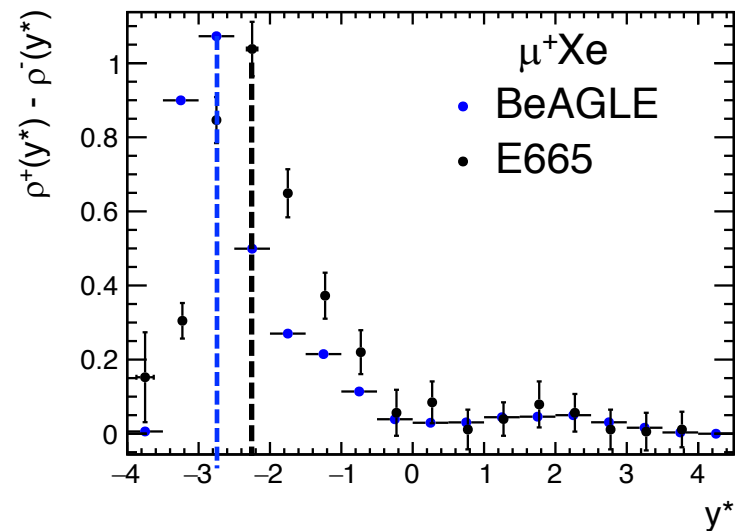
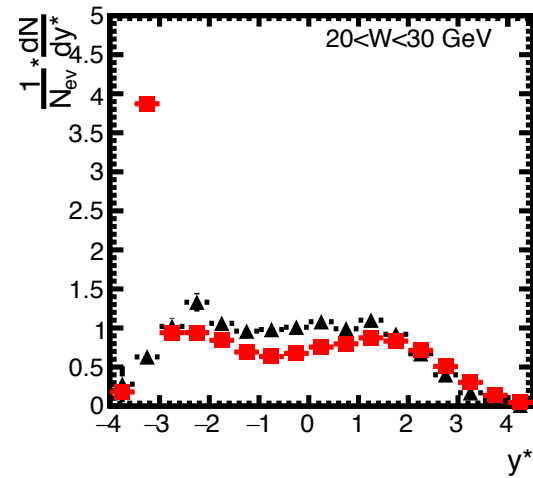
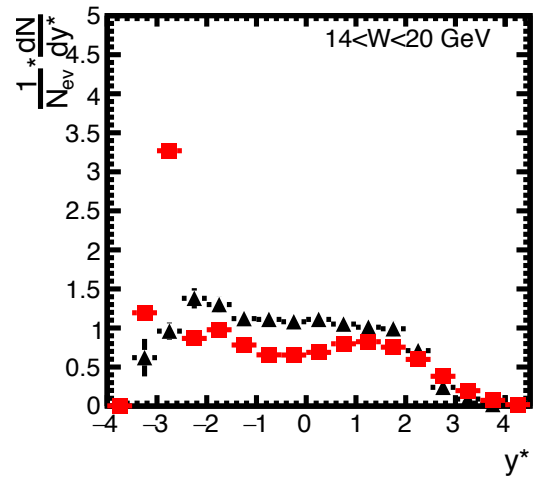
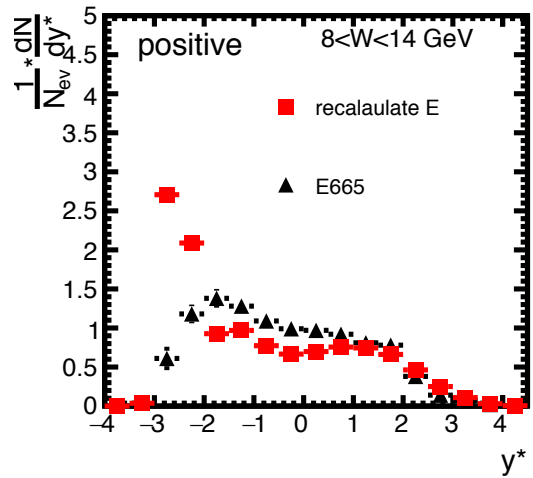
BeAGLE vs. E665

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2020/06/04

BeAGLE vs. E665 of muXe

drop all mu+



For more accurate , I'll try to drop the highest energy mu+ in each event

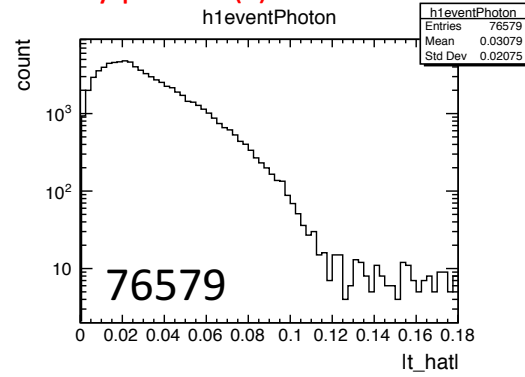
Incoherent diffractive events

$$e + \text{Pb} \rightarrow e' + J/\psi + X(p, n, \gamma)$$

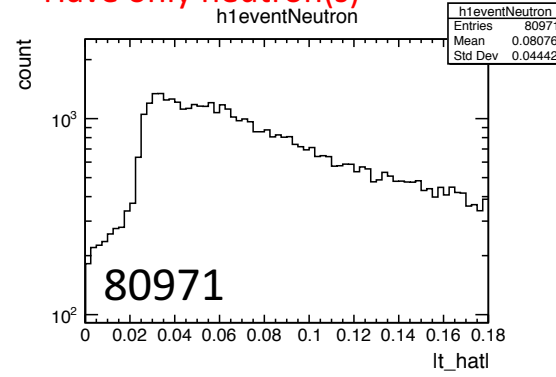
18x110 GeV

1M events

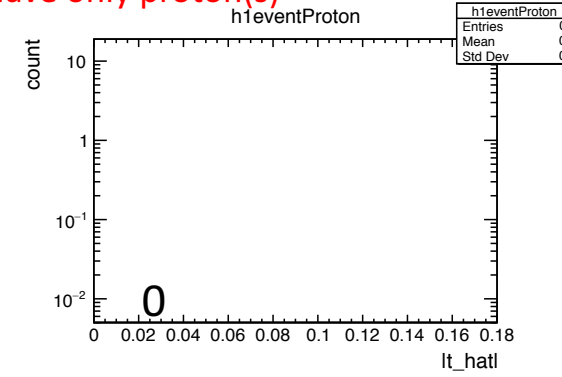
Have only photon(s)



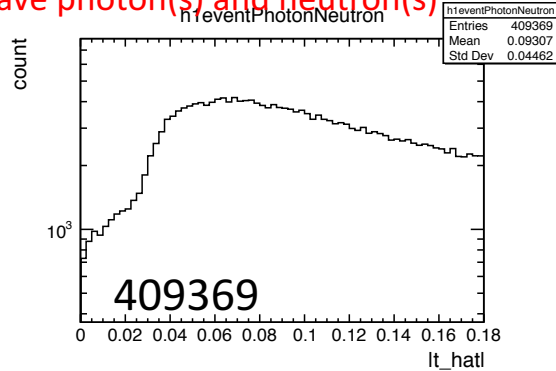
Have only neutron(s)



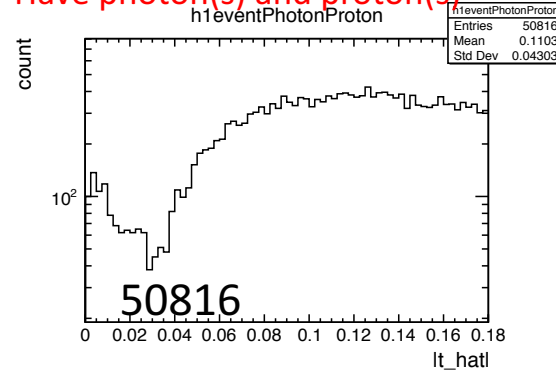
Have only proton(s)



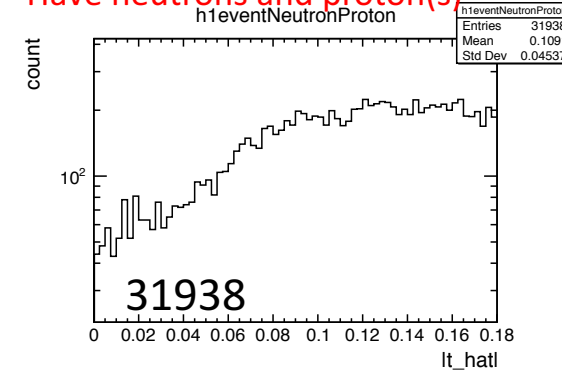
Have photon(s) and neutron(s)



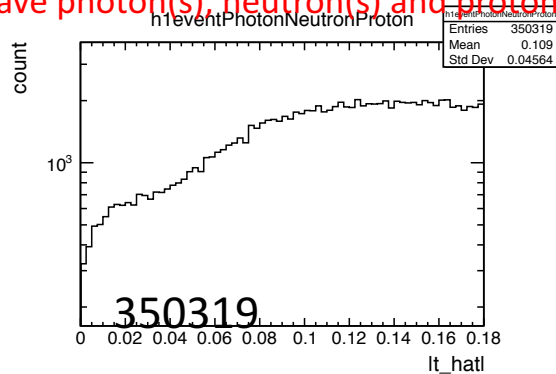
Have photon(s) and proton(s)



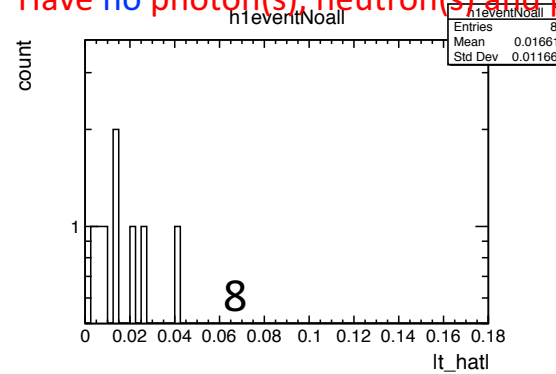
Have neutrons and proton(s)



Have photon(s), neutron(s) and protons

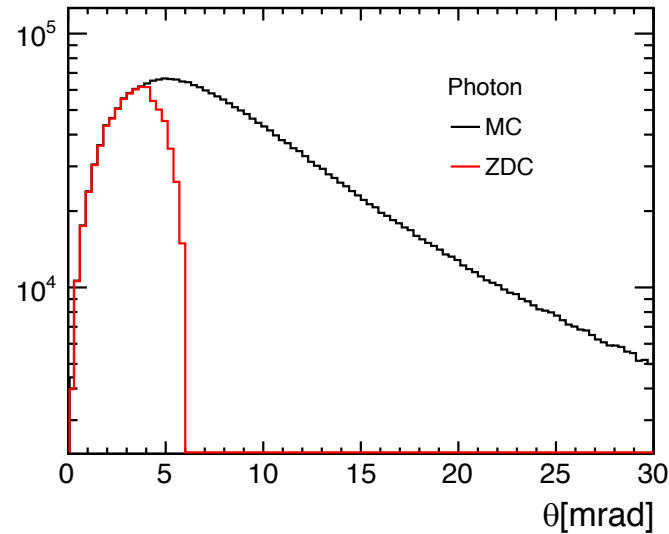
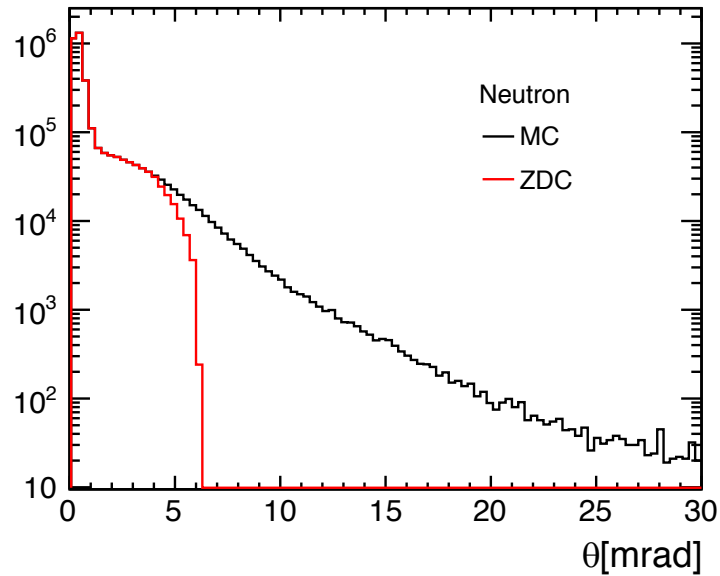


Have no photon(s), neutron(s) and protons

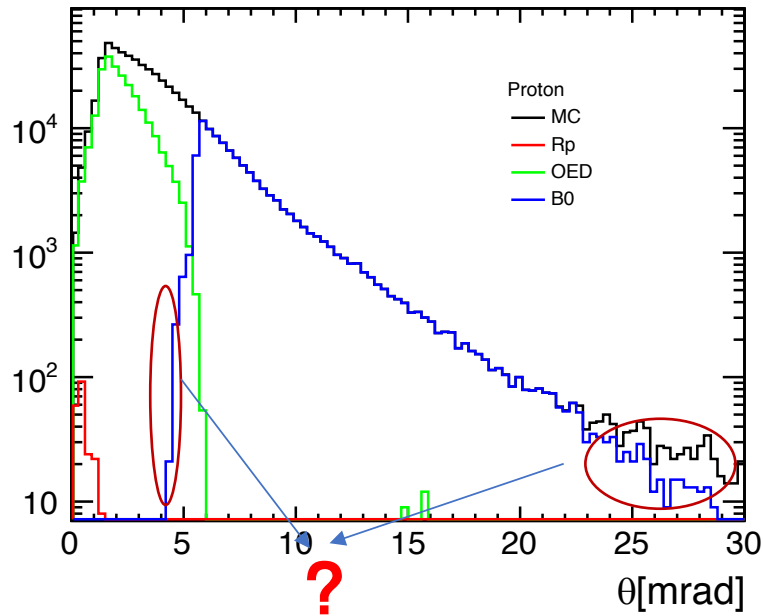


➤ These are all truth particles, final stable particle from data sample

Theta distribution



For photon, I didn't apply the energy cut.



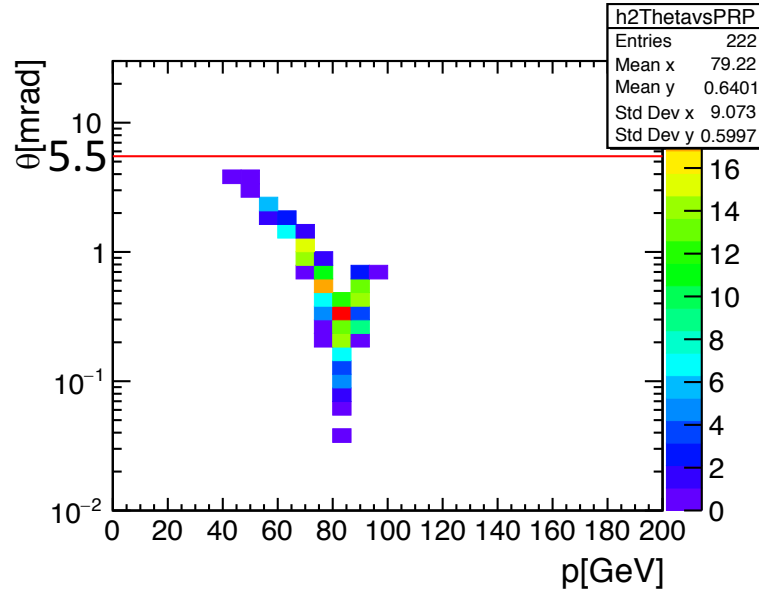
For rp, require the proton leaves 2 hits and 10σ away from beam central trajectory.

For off energy detector, require the proton leaves 2 hits and the hit on the second sensor have a local x coordinate greater than 20.0mm

For B0, require the proton leaves at least 1 hit in any of the 4 sensors

Proton $P \sim \theta$

Proton accepted in RP



Rp:

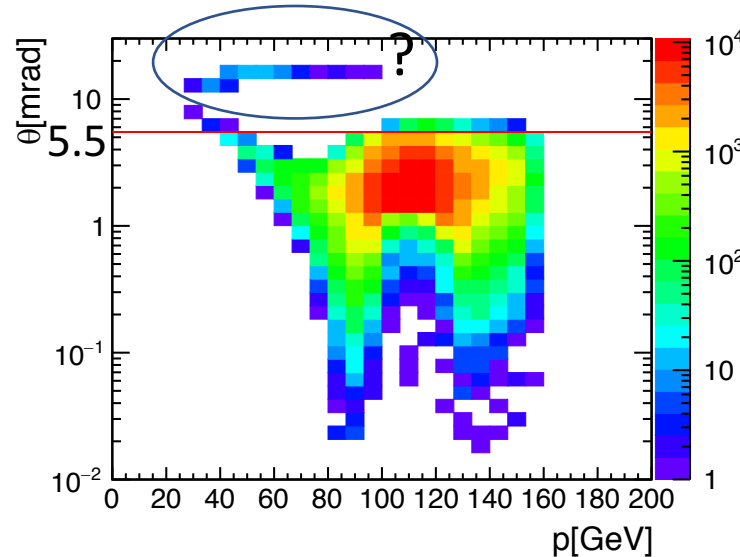
beamLineOffsetZ = 28100.0mm

beamLineOffsetX = 100.0mm

waferWidth = 250.0mm

waferHeight = 100.0mm

Proton accepted in off energy



Off energy detector:

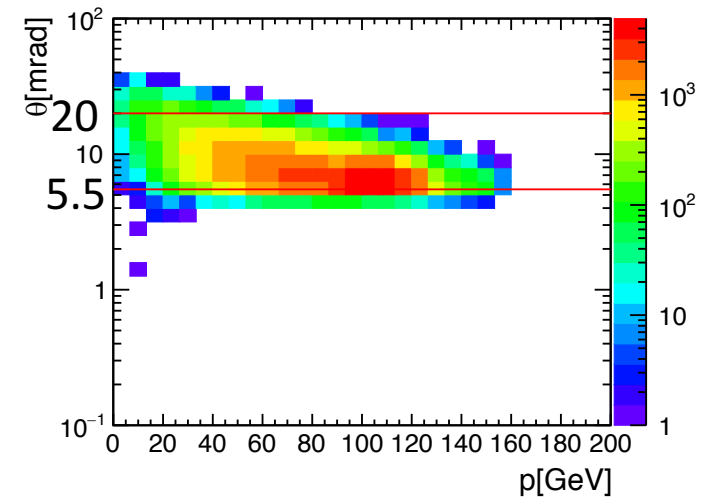
beamLineOffsetZ = 22500.0 mm

beamLineOffsetX = 200.0 mm

waferWidth = 700.0 mm

waferHeight = 350.0 mm

Proton accepted in B0



B0:

beamLineOffsetZ = 5900 mm

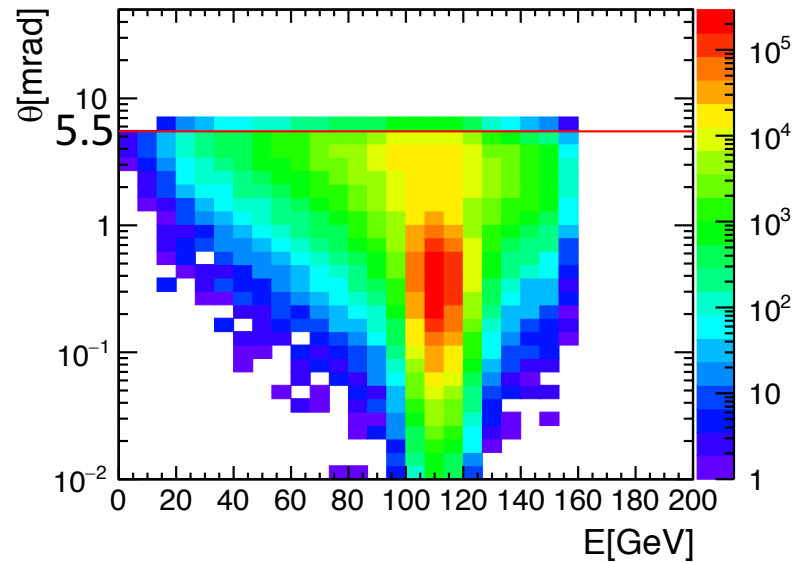
beamLineOffsetX = 190.0 mm

waferWidth = 350.0 mm

waferHeight = 270.0 mm

Accept in ZDC

Neutron accepted in ZDC



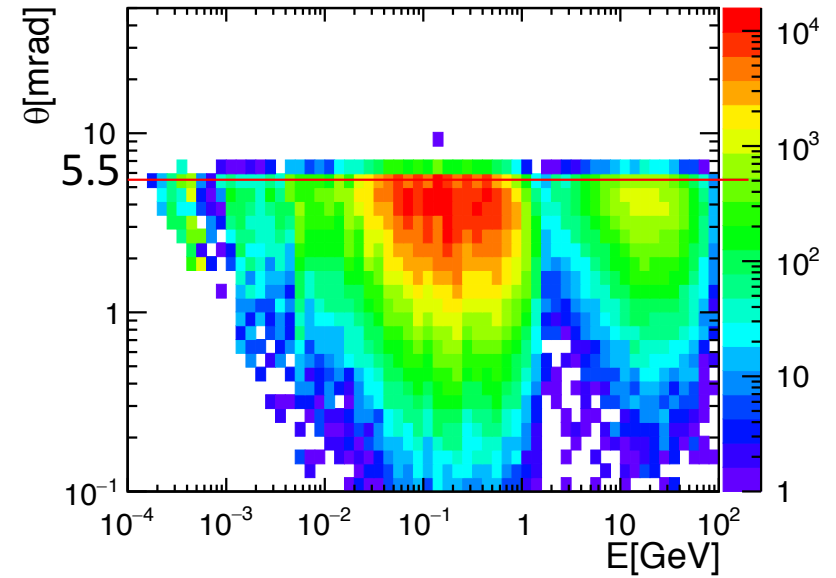
ZDC:

beamLineOffset = 38000 mm

zdcWidth = 600.0 mm

zdcHeight = 600.0 mm

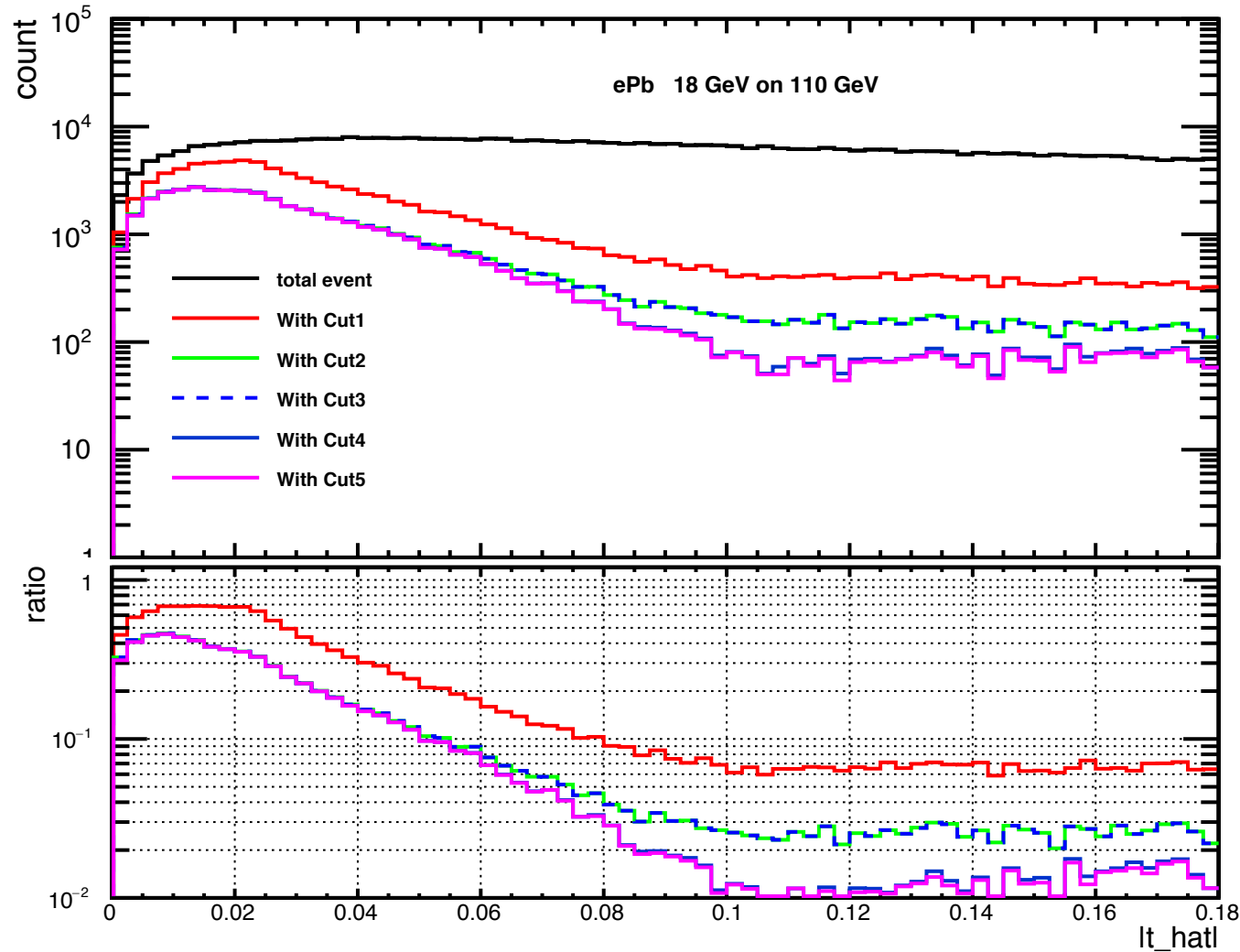
Photon accepted in ZDC



For photon, I didn't apply the energy cut.

Backup

Event distribution



Cut1:

➤ no neutron in ZDC

Cut2 :

➤ Cut1 + no photon $E > 50 MeV$ in ZDC

Cut3:

➤ Cut2 + no proton in Roman Pots

Cut4:

➤ Cut3 + no proton in off-energy detector

Cut5:

➤ Cut4 + no proton in B0

Survived event count	
Total events	1000000
Cut1	139099
Cut2	66522
Cut3	66520
Cut4	59931
Cut5	53454